Instructional Technology and Educational Reform: 1977[1]

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Not long after I accepted Lawrence Fraley's invitation to speak to you at this meeting, I received the formal Call for Papers. When I read that document, I was nearly overcome by fear and ready to back out of my agreement, which I had arrived at only with some trepidation. I was frightened by the "areas of research" suggested: *Instructional Systems, Economics of Behavioral Systems of Instruction, Methodologies, History and Philosophy*, and so on. I didn't know that things had gone so far — that so much was taking place —; and it was all so complicated. I didn't know what "position papers" were; I didn't know the difference between a "full system" and an empty one; I hadn't thought about the problem of "tutoring styles," or "quality indices," or "strategies of study"; and I was really shaken up by "organizational implications," and "legal issues" — was I going to get into trouble with the law by participation in this program? I was staggered by some of the questions: "What are the practical implications, both for students and for teaching arrangements, of various philosophical foundations about the nature of man, learning, and the purpose of education in society?" You can see the pickle I was in.

That night I had a dream. It was late afternoon, I was standing in an open space, and I could see before me in the distance an enormous reservoir of water, shimmering in the sunlight. From this reservoir came a giant duct which quickly branched into a thousand interconnected smaller pipes, a foot or so from the ground and extending in every direction. Standing here and there among these pipes were dozens of men and women, all looking very much alike and all equipped with wrenches, with which they were opening and closing valves to regulate the flow of water through the system.

Near me, at the end of this complicated network, was a pipe that had a faucet, and beside the faucet stood a child, hollow-cheeked and thin, holding a cup to catch the water as it came out slowly, drop by drop. Behind the child were many others, waiting with their cups and dressed as if to go to school. Suddenly it seemed to me that the shining reservoir contained the teachings of our scientists and scholars; that the little children were our students; and that the men and women with the wrenches were behavioral engineers, trying to direct the flow of learning through the educational system.

When I asked my therapist about this dream, she suggested that I had been doing too much reading in the field of education. I said, "You know that I do very little reading; my eyes are bad and, besides, it would take away from my originality." Her answer was: "Perhaps you ought to do *more* reading."

I didn't understand her comment, but I decided to follow her advice. Rather than be creative, I would do some reading, to allay my fears and to prepare for this occasion.

The first thing I discovered, in print that I could handle, was an account of educational reform at one of our nation's leading centers of higher learning, Harvard University. In his Annual Report for 1975-76, Dean Henry Rosovsky described the current status of a reassessment and reformulation that is going on within that institution.

> "After a year of intense deliberation," says the Dean, "our review of undergraduate education has reached a critical juncture . . . . . [S] even task forces have concluded their investigations and made provisional recommendations for change. These will now be considered by a coordinating committee, which will design an integrated set of proposals for faculty debate. The present moment seems appropriate to indicate the major themes that have emerged in our deliberations." (Rosovsky, 1975)

An exciting prospect is presented in this statement. The Dean of the Faculty of Arts and Sciences at Harvard is a figure of distinction in the academic world. His institution is perhaps the leading one of its kind in the United States. Whatever takes place in Cambridge is likely to be copied in other colleges of liberal arts within our land. How does Dean Rosovsky view the situation? What are the problems with which his task forces were concerned? What will be the major issues of faculty debate? What important changes are in prospect? We know that there is trouble at many other places. How will Harvard help us?

The Dean is ready with some answers. First he tells us what a Harvard person should be like on graduation from the College. (1) He [I use "he" to mean "that person," as I am told it meant in Middle

[1]Paper presented at the conference on Behavior Research and Technology in Higher Education, University of Pittsburgh, September 1977. Soon to appear in Fraley, L.E. (Ed.), *Behavior analysis and technology in higher education*, in press.

English] should be able to "think and write clearly and effectively." (2) He should have an "informed acquaintance" with "physics, biology, mathematics, history, the various social sciences, and the humanities." (3) He should not be ignorant of "other cultures and other times." (4) He should understand, and have thought about, moral and ethical problems. (5) He should possess good manners and have "high esthetic and moral standards." And, (6) he should have achieved depth in some field of knowledge.

Related to these aims of Harvard education were the task-force operations, each of which was led by a distinguished scholar. The first of these examined the *composition of the student body*. This body was found to be "exceedingly heterogeneous," reflecting well "the character of our [national] population." One can no longer tell a Harvard person from one of any other institution.

A second task force considered the matter of *concentrations*. It found, as I think we would expect, that each Department was in excellent condition. The faculty has no dearth of scientists or scholars.

The third task force dealt with the question of a *core curriculum*. It proposed an eight-part substitute for Harvard's old requirement of Social-Science, Natural-Science, and Humanities courses. The new curriculum, which will probably be accepted, is meant to guarantee some *breadth* of study — "informed acquaintance with" — just as concentration guarantees some depth.

Task Force Four, concerned with *pedagogical improvement*, is the one that caught my eye. Pedagogy deals with what the teacher does — the art or method of his teaching. But in the Dean's Report it deals not with how to teach, but how to motivate the teacher — especially the teacher in the core curriculum. Shall we give him special status, hope for earlier promotion, a higher salary, more assistance, or a greater amount of time in which to prepare his lectures?

Task Force Five looks after *educational resources* — money, that is, for the departments that contribute to the core. Task Forces Six and Seven also had supportive matters to consider. The former was concerned with *advising and counseling* students, and the latter dealt with *college life*.

There we have it: the latest thing in educational reform at one of the greatest seats of learning in our land. The aims of a Harvard education, as stated by the Dean, will meet with the approval of many other educators in many other places. The questions that were raised are familiar to us all, and so are all the answers. *Whom* does Harvard hope to teach? A student body of widely dissimilar elements, as at other institutions. *What* will Harvard teach? Mostly what was taught before, but prepared in a different way and coated with fresh requirements. *Why* will Harvard teach? To produce an "educated person," whose salient features are familiar to us all as an ideal. As for the *how* of Harvard's teaching (and for the *when* and *where*, which could depend upon the *how*), nothing has been altered or seriously considered, if we can judge from this report.

Dean Rosovsky recognizes problems in this field, even to the point of saying that "effective teaching is an issue that transcends the matter of the core curriculum," and he notes that students may be dissatisfied in the encounter with their teachers; but this is a Pandora's box which he does not choose to open. "Good teaching," says the Dean, "is a highly individual matter and does not lend itself to formulas."

At this point I can hear objections. For example: Harvard is more typical of Ivy League education than of education generally in the United States, and you exaggerate its power as a model. As Harvard goes, so goes Yale. Things are better elsewhere. Wealthy, prestigious schools have always been slow to change, but look at what is going on in other places — in community colleges, for example. And even Harvard isn't as bad as you make out. A number of instructors there are trying out new methods. Some of them are even using "personalized instruction," which surely ought to please you?

So I decided to continue with my reading, in order to get a broader view of what was going on, which I soon discovered in an important publication by the American Academy of Arts and Sciences in 1971. The Academy had set up an Assembly (a sort of blue-ribbon committee), and the Assembly had produced 85 "theses," dealing with the "goals and internal organization of universities and four-year colleges." (American higher education, 1975) These theses, or propositions, made up the Assembly's first report.

Nine general *themes* were listed as pervading all the theses. Two of them caught my eye. One said that *learning* is higher education's central mission —"learning that takes place between student and teacher, student and student, teacher and teacher, and between these and the staff, alumni, and citizens concerned with intellectual and pro-

fessional pursuits." (pp.322-323) The other was called "enhancing the professoriate:" "It is time to upgrade the art of teaching, to create an environment in which learning is as important for teachers as for students, to develop collective and selfenforcing codes of responsibility." (p.325)

This sounded good to me, so I read the 85 Theses. I can tell you that they deal with many problems and offer many recommendations, relative to policies of admission, student-body composition, curricula and their diversification, teacher evaluation and appraisals, faculty replacement, revision of the university calendar, and many other matters. Ten or twelve of them contain some reference to teaching, but not one of them deals directly with the teaching process. The strongest statement on pedagogical reform that I could find was in Thesis 38, which suggests more use of independent study and small-group tutorials, and says that professors and administrators should inform themselves on "audio-visual and other technical devices, some of which reduce staff costs." So I thought I ought to read a little further.

In 1974 and 1975, the Academy's journal, *Daedalus*, was filled with a total of 80 papers, written by outstanding figures in the world of American education. These contributors had been asked to reflect upon the academic scene ten years after the beginnings of the so-called "university troubles" in this country. What changes did they think had taken place; what ones were most important; and what interpretation of them should be made? Where was higher education going in the coming decade?

The contributions to these volumes differed greatly. There was disagreement with respect to every issue raised. There was general concern, however, as to what should now be taught to students, what students should be taught, and for what length of time and for what purpose. I read about the goals of education, the "steady state" of university enrollment, the fading of the four-year private college and the role of students, professors, presidents, and trustees in university administration. I read about consortiums, continuing education, and curricula of different kinds; about accountability, faculty tenure, and the teachers' union.

These matters were discussed by experts, with clarity, wisdom, and conviction; often with eloquence and charm; and sometimes with humor. It was a most enlightening experience for me. But only two of all these 80 educators took serious account of the technology of teaching — the *how* of higher education. One of the two was an economist, Elizabeth K. Allison, the other a psychologist, B. F. Skinner, and both were Harvard University professors.

By this time I had begun to think that the technology of teaching was of almost no concern within the field of higher education. I was ready to give up my reading and return to my creative work, when I heard about a book, by even greater experts, that was oriented toward the future, rather than the past. (The *Daedalus* papers were usually retrospective, dealing with the demonstrations of the 'sixties and their effect upon the present.)

The name of the book was *The Third Century*. It was written by 26 prominent Americans, from a list of 44 who had been selected by 4,000 college and university presidents, foundation executives, journalists, and government officials, who were polled by *Change* in 1974. The book came out this year; I have read it; and I shall tell you what I found.

These members of *Who's Who in Higher Education* had different basic interests, different issues to promote, hence different things to say about the future. Among the things that were predicted, in decreasing order of mention, were (1) *lifelong learning*, to accommodate refresher courses, occupational training, unavoidable educational interruptions, and learning simply for the sake of learning. In other words, we are going to fill the classroom chairs for a greater number of hours every day.

(2) A greater degree of *egalitarianism* is expected in the future. Those who didn't have a crack at higher education in the past are going to get one in the years to come. This extension of our student body fits in well with lifelong learning in helping to fill the schoolhouse.

(3) The *Government* is expected *to play a greater part* in the control of education than it does at present, imposing certain limitations and requirements. Since he will be helping to pay the bills, Uncle Sam is going to have a say in *what* we are to teach, as well as whom and when.

(4) Two contributors of the 26 specifically predicted that our *techniques of teaching* would be changed. One of these was K. Patricia Cross, an educationist from Berkeley; the other was Alan W. Ostar, Executive Director of the American Association of State Colleges and Universities. Dr. Ostar noted that, by the year 2000, "Faculty will become learning resources instead of simply lecturers. The teaching process will reflect the fact

that not every student learns at the same rate or begins at the same level. The emphasis will be on personalized learning programs, just as it is now on lecture learning." (pp.171-172)

Patricia Cross was more expansive: ". . . Education for all was a twentieth-century goal; education for each will be the major goal of the twenty-first century. The components of the model are already in place: individualized instruction through self-pacing; individually designed learning contracts, personalized systems of instruction, personalized growth groups . . . Ironically, we are discovering that mass education is not the inevitable route to education for the masses . . . (pp.111-112)

". . . Passing from the scene is the all-consuming concern about growth that built the administrative machines of education; going, too, is the arrogance of the disciplinary specialists who enter college classrooms proud of their disdain for pedagogy."

John R. Silber, President of Boston University, also was aware of new techniques of teaching, but placed them in a different context. "From the perspective of the year 2025," he has the following to say in the concluding chapter of this book:

> The new egalitarianism, which taught that there must be not only equality of access to higher education but also equality of result, developed rapidly after 1976. Behavioral objectives and competence-based programs were instrumental in this development: Once it was decided that the time it took to learn something was irrelevant to learning, it was possible for medical students who took five years to master organic chemistry not only to practice alongside their fleeter colleagues, but also to buy the same no-fault malpractice insurance. By century's end, a movement arose to rid higher education of its speciesism — its exclusive preoccupation with the education of human beings. The Department of General Welfare ruled that the fact that a dog took 10 weeks to learn to shake hands (one of the basic requirements for a doctorate under reforms introduced in 1984) must not be held against it. The important thing, GW argued, was the dog's eventual competence. (p.195)

Dr. Silber's commentaries on the current scene in higher education are highly valued and often quoted by a number of his colleagues.

These were the highlights of my reading, and I was getting tired. The topics treated by the higher educators still seemed fairly distant from those that were listed in the Call for Papers for this meeting. Then, suddenly, I was asked to write a book review. (Everyone assumes that I have nothing much to do because I live down South.)

I was preparing to say *No*, when I discovered that the author of the book in question was none other than Patricia Cross and that the title of the book was *Accent on Learning: Improving Instruction and Reshaping the Curriculum*. This seemed to be exactly what I had been looking for. So, in order to get the book without expense, I said *Yes* to the request.

My review was not a very good one. I followed all the Journal's rules and wrote 500 words as called for. *This* report will wander as it wishes and take as many words as it requires. I hope its quality will be better.

The book was readable, comprehensive, and straightforward, suitable for teachers, administrators, and students of education — even educated laymen of another generation than the present. It had already won a prize within a year from the time that it was published. The message that I got from it was clear.

First, the presence of "New Students" in our colleges and universities has raised some problems. "New Students" are those who would not have been accepted for admission prior to the "open door" of recent years. Such students would have been described by Dean Rosovsky as contributing to an "exceedingly heterogeneous" population.

Remedial attempts to bring this population into the academic mainstream have been largely ineffective. Many of these students will never be successful in the way we'd like them all to be. They will never really catch up with the others. How can we let them all achieve success, which is their due?

An instructional revolution is now going on. (I was glad to hear that!) New technology provides for treatment of the individual, rather than the group. This technology includes programmed instruction, computer-aided and computer-managed instruction, mastery learning (the "central concept"), the audio-tutorial method, and personalized instruction (PSI or *Psi*). These procedures may ensure the mastery of college courses by some of these "new students", but will *not* produce first-rate scholars. They may even over-emphasize course *content* and be almost *too* efficient, "especially with our inadequate knowledge about the learning process." (At this point I began to wonder if Patricia was really on our team!)

We must look for other means by which to guarantee for all our students "the opportunity for high level achievement." Perhaps we shouldn't worry so much about our *methods* as we should about our *missions*. Rather than focus on the weakness of our student in the academic sphere, why not focus on his strength in others? In short, why not

alter the *curriculum* to fit the student's special needs?

The United States Department of Labor, in 1965, decided that all jobs could be classified "according to the amount and level of skill required in working with *data*, *people*, and *things*." [Italics mine.] Since these skills are essential to the functioning of society in general, why shouldn't they be reflected in our educational program at the highest level? Why should we deal exclusively with *data* learning, as we seem to be doing now, and ignore the skills that deal with *things* and *persons*?

What we need is a curriculum with three dimensions, rather than just one. *Excellence* should be required of every student in one of these dimensions, and *adequacy* within the other two.

> Students who have interest and ability in the manipulation of ideas would pursue academic excellence, but they would also be required to develop adequate skills in working with things and people. The development of interpersonal skills would no longer be left to extracurricular activities and to chance, but could be consciously developed so that future counselors, receptionists, and social workers could pursue excellence in human relations. Future sculptors and future auto mechanics would pursue excellence in the manipulation of tools and materials, but they would also develop basic adequacy in traditional subject matter and in working with people. (p.10)

This is what Patricia Cross proposed. She does not tell us how the currently trade-school functions can be transferred to the university campus (as we did some time ago with agricultural pursuits), but she does have several chapters on *personal development*, as viewed by "humanists" and others; on *learning about people from people*, by way of T-groups and the like; and on *interpersonal skills*, wherein we find how difficult it is to identify them, to implant them, and to measure them in degree. Most of the "learning" in this section of the book is "experiential", in which the behavior to be set up and evaluated does not readily meet the eye.

Accent on Learning thus became *Accent on Curriculum*, and I was back again with Dean Rosovsky. New instructional procedures, having been extolled, were finally pigeon-holed as useful mainly in the service of upper-level academic learning, where they may do their job almost too well. (I should have mentioned that the book contains a scholarly and sympathetic treatment of *cognitive styles*, psychology's great white hope within the field of educational technology, but no practical claim was made by Dr. Cross for this endeavor at this time.) I looked in vain for the conclusion that the powerful new techniques of teaching, had they been used within the grade schools, the high schools, and the trade schools, might have averted the deficiencies that required remedial attention at the college level — which led to Dr. Cross' curricular proposal. Her interests were possibly too confined to *higher* education and to those unhappy souls who approached it through the "open door."

What knowledge did I gain from all my reading? Well, I learned, for one thing, that the interpretation I had given to my "pipe dream" was in error. The people standing there with wrenches were not behavioral engineers, but educators, working with curricula. This new interpretation is related to the following conclusions.

(1) Our educational leaders, with rare exceptions, are still concerned with other matters than the technology of teaching. The survival of the institution is not seen to depend upon the way in which it carries out its basic function, that of educating students. A college president or two, a few enlightened deans, and a handful of disillusioned or danger-loving teachers may have been affected, but the "instructional revolution," if there be one, is still far from bringing about reform in higher education.

(2) Conferences like the one that we have just attended have had but little impact on the policies and practices at this upper level. They may have served a mutually rewarding function for researchers in the field and they may have built up courage for continued effort (under circumstances often quite aversive); they may have opened up new areas of investigation; and that may have furthered the professional advancement of participants, in one way or another. But the analyses, the insights, and know-how of the men and women featured on these programs have not brought about, and probably will not bring about reform in higher education.

Our officers of education, our governing boards of colleges and universities, the educational committees and task forces — none of these will soon be calling for the helpful counsel of a Donald Cook, a Jack Michael, or an Ernest Vargas; for the experience of a Richard Malott or a Henry Pennypacker; or for the expertise of a James Holland, a Paul Touchette, a Gilmour Sherman, a Susan Markle, or a Julie Vargas. Such aid may be asked for by individual, dedicated teachers, but the voice of the technologist of teaching is unlikely to be heard throughout the upper echelons of higher learning.